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Field Investigation Report

North Pole Refinery
25 Mile Richardson Highway
North Pole, Alaska 99705
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Date of Investigation

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Investigating Personnel

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Background

North Pole Refinery, located in a sparsely populated section of North Pole 14 miles southeast of Fairbanks, began operations in 1977. The refinery is owned and operated by Earth Resources Company of Alaska (P.O. Box 5028, North Pole, 99705). The property is leased from the State of Alaska.

Site Investigation

The refinery, greater than 20 acres in size, is composed of an office/work shop building; the refinery building, and a number of above-ground fuel-storage tanks. The Golden Valley Electrical Company is located next to the refinery (see attached sketch map). The entire complex, including the electrical company, appeared in good condition.

We met Philip Nickpond, chemist and process planner, at his office before we toured the refinery. Mr. Nickpond stated that the refinery produces jet fuel for both commercial and military aircraft, kerosene, #2 diesel fuel, and turbine fuel. North Pole Refinery obtains its crude oil from the Alyeska pipeline. Mr. Nickpond stated that the crude oil

may be refined directly from the pipeline and/or may be stored in a storage tank and refined at a later date. Unused crude oil in this storage tank may be returned to the pipeline. In this way, North Pole controls the amount of oil it refines in any one day.

Mr. Nickpond reported that the refinery draws about 32,000 barrels of crude oil from the pipeline per day, but refines about 12,000 - 14,000 barrels, storing or returning the remainder. Mr. Nickpond stated that North Pole Refining, using a distillation process, heats the crude between 400° - 600°F in order to separate the oil into its various components. The refined petroleum products are then stored in above-ground fuel-storage tanks.

From 32,000 barrels of crude oil, North Pole produces the following:

Jet fuel	2800 barrels/day
Kerosene	5400 barrels/day
#2 fuel oil	1800 barrels/day
Turbine fuel	2200 barrels/day

Mr. Nickpond stated that most of their products are used in the Fairbanks' area. North Pole Refinery stores refined products on-site and at the Fairbanks International Airport; North Pole also leases storage facilities from Texaco, Chevron, and Tesoro. Natural gas from the distillation process, Mr. Nickpond stated, is used to heat the distillation towers rather than being burned off into the atmosphere.

North Pole Refinery uses various oil additives during the distillation process. Ethyl glycol and propyl glycol are added to the refining system as heat-transfer agents. Additives for pH adjustment, anti-corrosiveness, and for removing water from the crude oil are all stored on-site. Mr. Nickpond stated that they use about one barrel of each additive per month; five barrels of each type of additive are stored at the plant at any one time.

When questioned about disposal practices, Mr. Nickpond stated that wastes from the workshop, e.g., paper, glass, old machinery, scrap metal, are taken to the Fairbanks Sanitary Landfill. Whenever possible, machinery is repaired on-site.

Waste oil from plant machinery, plant vehicles, and minor spills is saved for road dusting. Oil from the distillation process is collected in concrete curtains that cover the ground area under the distillation towers and under the major pipelines of the refinery. These curtains

empty into sump drains. Waste oil and kerosene collected in this manner is recycled (redistilled); Mr. Nickpond explained that the waste water is vaporized into the atmosphere. He also said that the distillation columns are cleaned by steam ("steam stripping") and the steam is vented off into the atmosphere. Mr. Nickpond reported that the high-temperature oil fraction (bottom of columns) that remains after the distillation process is returned to the Alyeska pipeline along with the unused crude oil. North Pole is not a "cracking" refinery, according to Mr. Nickpond.

Mr. Nickpond stated that oil from major spills is collected and, if possible, redistilled; non-redistillable oil is used for road dusting. He went on to explain that while "there are some problems with containing small spills (50 gallons/less), North Pole and the Alaska Department of Environmental Conservation have been working together to reduce the likelihood of spills." Mr. Nickpond stated that in addition to oil refining, there were plans to expand North Pole Refining to include a petrochemical plant.

The Facility

After our conversation, we toured the facility. The plant, situated on flat terrain, is about a mile from the Tanana River. The entire plant is fenced and gated. The rubbish dumpster is located northwest of the administration building just before entering the main plant. The area within approximately a 3-block radius of the refinery is forest. Mr. Nickpond took us to the oil distillation work area explaining on the way that the Golden Valley Electrical Company supplies the refinery with much of its electrical power. At the oil distillation work area, Mr. Nickpond pointed out where the ethyl and propyl glycol are added to the refinery system, as well as the chemical-additive storage area. We proceeded to the distillation towers where the crude oil is refined and examined one of the waste-oil sump drains. Mr. Nickpond pointed out where crude oil is removed and returned to the Alyeska pipeline. Workers were laying down a small pipe while we were there; a puddle of oil was in the bottom of a small pit. Mr. Nickpond told us that a new sump pump line was being installed.

We then toured North Pole's control room. At the control room they monitor the flow of oil through the plant, its movement to and from the storage tanks, the temperature of the distillation towers, et cetera. Mr. Nickpond brought us to the small chemical laboratory within the control room building. At the laboratory, they test the refined product for color, viscosity, and fogging properties. The chemist stated that these tests and others have to be performed to insure that the various finished products

are up to proper specifications. Chemicals (e.g., aniline, mercuric nitrate, toluene) used in the laboratory are dumped down a "sump sink" when no longer effective. These old chemicals, as well as laboratory tested oils, are recycled through the refining process.

We observed that the oil-loading area was stained with oil. Mr. Nickpond said that the tank trucks overflow on occasion. They are monitoring this area in order to prevent this type of uncontrolled spill.

Conclusion

North Pole Refinery does not seem to be generating any hazardous wastes that they are storing and/or disposing of at the plant. The disposal practices for other wastes appears to be controlled. Mr. Janssen stated that North Pole Refining is "a pretty clean operation" and that"if and when they have any kind of major spill, North Pole will notify the Alaska Department of Environmental Conservation."

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